

Monitoring and boosting environmentally beneficial practices in the olive grove within the framework of the new CAP measures



There are several technologies with potential application for key soil and environmental variables. These variables are included as potential indicators of eco-schemes and, as well, application of best practices. In the present case study, different approaches based on Copernicus will be evaluated and tested for monitoring of best practices under the new CAP.

Summary

The combination of Sentinel satellite imagery, spatial software capable of analysis and assessing the eligibility of features and land uses based upon probability assessments and geotagged photography under controlled conditions together present the opportunity to minimise the need for traditional on-the-spot controls. The benefits of this approach will be multiplied if this data collection process occurs in synergy with other digital technologies, such as crop monitoring and yield forecasting, bringing greater efficiencies to farms. Soil Organic Carbon (SOC) and Soil moisture will be evaluated under the potential eco-schemes from the new CAP.

Objectives

Soil resources can be managed to help mitigate climate change, to increase agricultural production and to maintain soil quality. Land management can influence Soil Organic Carbon being the main component of Soil Organic Matter. Soil formation can be influenced by temperature, moisture regime, soil properties and their interaction with soil biota. The main objective is the monitoring of SOC changes in olive groves under beneficial practices as key variable for soil quality status and to help mitigate climate change.



Problem description

The Integrated Administrative Control System (IACS) introduces specific regulatory requirements and technological tools (Geo Spatial Aid Application, LPIS, etc). The current IACS incorporates different databases (farmers' register, animal register, LPIS, entitlement register, claim databases) but not a methodology to monitor agricultural beneficial practices. In the draft IACS legislation for the new CAP, there is the possibility of introducing data and monitoring systems using Copernicus/Sentinels satellite data or equivalent. Currently, there are several reports on the potential for the use of technologies such as satellites, drones, artificial intelligence, which would support a large part of these tasks, reducing costs in transporting technicians to the plots and increasing the number of plots to be monitored. However, if these types of technologies are not facilitated and supported by policies, they can hardly be widely implemented. The methodology developed by Evenor-Tech is based on MicroLEIS and CarboSOIL model, and earth observation techniques for monitoring water retention. For that, validation in-situ model with EO services will be carried out considering tillage management variables (plantation system, vegetation cover, and residues). The final step is developing pedotransfer functions for finding relationships among indicators for soil carbon content and soil water retention and bands or indexes from Sentinel.

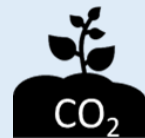
OTHERS

Monitoring of environmental performance using novel technologies

PUBLIC GOODS



Soil quality (and health)



Climate regulation-carbon storage



Rural viability and vitality

INDIRECT EFFECTS

Water quality, climate regulation, biodiversity, soil fertilisation.

LOCATION

SPAIN
Andalusia

CONTRACT

The contract can cover the whole farm or only single parcels depending of surface declared. It is based on public funding by the government (with EU-cofunding). It is a public-private contract between the administration and the farmers.



Contract conclusion:
Via online platform

Payment mechanism:
Subsidy



Funding/Payments:
The financing is provided through direct payments and agri-environmental aid to olive farm holders participating in the voluntary measures set in line with the Common Agricultural Policy. However, regarding the potential eco-schemes in the new CAP, new contractual relationship could be monitored through remote sensing related to promotion of public agri-environmental goods.

Length of the contract:
open-end



Data and Facts - Contract

Participation: With just over 1.52 million hectares, the olive cultivation occupies more than 30% of the agricultural area of Andalusia, acquiring an important importance in the province of Jaén, the south of Córdoba, the northwest of Granada, the north of Malaga and the southeast of Seville. Currently, more than 240.000 has were declared under CAP payments. A total of 30 farmers will be targeted in collaborate during the project, related with ASAJA members, attending to crop management, payments received and others variables.

Involved parties: The contracting parties are on the hand the participating farmers. The main participants in the case study will be from the ASAJA network. Most of them apply beneficial practices in their olive groves (in some cases under integrated production also). Another involved part is the regional administration and payment agencies. They are responsible to check the correct tasks declared under the CAP. Currently, the methodology for the on-the-spot controls is based on a first analysis by satellite image (mainly crop identification and surface declared).

The benefits for land managers or farmers: Maintaining of soil quality, greater competitiveness. In the end, the final product reaches the consumer in form of high quality oil or olives.

The benefits for administration: Maintaining rural activity and less on-the-spot controls.

Management requirements for farmers: Real exploitation of plots, real agricultural activities.

Controls/monitoring: Each year a monitoring/certification of the activity of the plots carried out through the registration of documentation, control of the plot, etc.

Conditions of participation: Participants have to be active farmers eligible to be beneficiaries of direct payments and agri-environmental aid. In the Spanish case, one of these three criteria must be met: that the annual amount of direct payments is at least 5% of the total income obtained from non-agricultural activities in the most recent tax period for the that such evidence is available; that their agricultural activity is not insignificant, on the basis that their agricultural income other than direct payments is 20% or more of their total agricultural income in the most recent available tax period; or thirdly, for legal persons or groups of natural or legal persons, that within their statutes it appears, before the end date of the period of modification of the application, the agricultural activity as its main corporate purpose.

Legal status of the contracting parties: Individual farmers and legal persons

Risk/uncertainties of participants: Errors in controls and payment reductions



Context features

Landscape and climate: The olive groves in the Andalusian case study are characterized by varying soils (Regosols, Cambisols, Vertisols, etc). The climate is sub-continental Mediterranean characterized by cold winters and warm summers.

Farm structure: It is aimed at those farmers who really have active productions and carry out an economic activity. Regarding potential eco-schemes (soil protection, climate regulation), the possibility is also sought that eco-scheme payments are based on an indicator such as the increase in carbon sequestration or lower water consumption, compensation is received based on the new CAP.

SUCCESS OR FAILURE?



The monitoring and boosting of environmentally beneficial practices in the olive grove within the framework of the new CAP measures is likely to become a success story. In addition, indicators benefitting novel technologies / satellite images such as carbon sequestration is one of the lines that the regional government pursues for mitigating the impacts of climate change.

Reasons for success:

The main reason for success is the possibility of maintaining small farms, which produce in a more conservative and sustainable manner considering the natural resources, compared to large farms. The potential success of the new contractual relationships is the society's demand for increasingly sustainable food and the societal concern about climate change.

SWOT analysis

Main Strengths

1. The Copernicus program contains a set of satellites with different bands, spatial and temporal resolutions that allow different actions depending on the objectives set
2. Access to data from the Copernicus platform is free, allowing greater economic stability in the development of services based on it
3. The use of open source allows its easy adaptation to other areas

Main Weaknesses

1. Areas with high cloud density
2. In some cases and for some tasks, the temporary resolution of 10 meters is not sufficient
3. Statistical analysis and complex programming languages are required for its development

Main Opportunities

1. Need to save costs by administrations
2. Current and developing policies encourage its use
3. There will be more and more satellites that will provide new and better opportunities

Main Threats

1. Policy changes or non-approval of the methodology by the competent administration
2. Resulting methodology not easily applicable by paying agencies
3. Errors in data collection